

HLW & FD EIS PROJECT - (AR)PF  
Control # DC-68

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on

Idaho National Engineering and Environmental Laboratory

Draft

High-Level Waste Environmental Impact Statement

Submitted on Behalf of the

Environmental Defense Institute  
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by

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## SUMMARY

The Problem

- 68-1 1. [The liquid high-level waste has been in INEEL underground tanks for over 50 years, 20 years beyond the tank's design life.] This liquid waste has acids and solvents strong enough to dissolve reactor fuel rods. Highly enriched uranium and other isotopes were chemically separated from the dissolved fuel rods for the nuclear weapons program, and the leftover liquid "raffinate" was sent to the underground tanks. [DOE claims the tanks have not leaked (tho the service lines have had major leaks), however, any alternative for treatment will take an additional 15 -20 years, making the leak issue extremely problematic.] Further treatment delay could prove disastrous. We can see an example of this at Hanford's leaking tank farm.
- 68-2 111.A (i) [The tanks and their concrete vaults were not built to meet current structural standards or seismic resistance standards. A minor earthquake or other stressful event could compromise the weakened tanks.] A burst tank would spell disaster for the Snake River Aquifer and all water users of the Snake River downstream to the Columbia and the Pacific Ocean.] The State of Idaho's justified concern over preventing further contamination of the aquifer through appropriate treatment of all high-level waste and requiring disposal in an out-of-state geologic repository of all high-level waste deserves our full support.
- 68-3 111.A (2) [Given the uncertainty of geologic repositories for TRU and high-level waste coming on line, and the reality of restricted space in those proposed repositories if they do come on line, and the commercial waste from nuclear power reactors have priority and will fill up available repository space; means INEEL is looking at long-term storage of high-level waste on-site.]
- 68-4 111.A (i) [DOE must not be allowed to reclassify formerly high-level waste as a means of avoiding regulatory disposal requirements. The States of Idaho, Washington, and Oregon's position opposing reclassification is the right one.] [EIS @ F-3]
- 68-5 111.C (8)
- 68-6 111.E (i) [The Calcliner must be immediately shutdown because it does not meet current RCRA permitting requirements or new EPA MACT standards.] DOE for many years has been unable to sample for all contaminants of concern in the stack emissions to determine if it meets current standards. [EIS @ 2-2]
- 68-8 111.A (3)
- 68-9 111.A (3)
- 68-10 111.A (3)
- 68-11 111.A (3)
- 68-12 111.B (1)
- 68-13 111.B (1)
- 68-14 111.D (6)
- The Solution
1. [Only treatment options that offer a long-term stable waste form that can be safely stored on site without further risk to the environment should be considered.] [EDI supports the State of Idaho's principled position that the following HLW EIS alternatives are not acceptable:

D-175

DOE/EIS-0287

- 68-15 <sup>vi.D(4)</sup> • options that leave any waste (including tank heels) in the INTEC [formerly Idaho Chemical Processing Plant] Tank Farm beyond the year 2012] and  
• [options that result in treated waste from the INTEC Tank Farm not being ready to be moved out of Idaho by 2035] and  
68-16 <sup>iii.D.3(1)</sup> • [alternatives that propose to dispose of low-level waste fractions separated from high-level waste at INTEC, or anywhere else at INEEL] and  
68-17 <sup>v(4)</sup> • [DOE attempts to manage the sodium-bearing high-level waste as anything but high-level waste.]  
68-18 <sup>iii.C(5)</sup> • [alternatives that allow continued operation of the Calciner in violation of RCRA permitting requirements and Clean Air Act requirements.]  
68-19 <sup>iii.D.2.4(5)</sup> 2. [Grouting was tried at Hanford and it failed miserably.] The State regulators in Oregon and Washington forced DOE to go to a full vitrification process for the liquid high-level waste. [DOE insisted on a separations process to fraction out the TRU from the non-TRU] however the regulators required vitrification of both waste streams because [there is no regulatory treatment distinction between the two, and they are both high-level wastes some of which will have to be stored at Hanford indefinitely.]  
68-21 <sup>iii.D.3(1)</sup> 3. [No known treatment options are without risk to workers and the public.]  
68-22 <sup>v(4)</sup> Discussions with Oregon and Washington regulators are clear that Hanford's vitrification plant will prioritize on-site waste first for processing which will take through the year 2038. [Hanford's treatment is not a viable option for INEEL waste because of this time delay and regulators resistance to importing HLW from INEEL given the site's inability to deal with onsite waste.] Additionally, DOE cannot ship liquid high-level waste, and DOE cannot put HLLW into non-compliant RCRA tanks at Hanford.  
68-25 <sup>ii.E(1)</sup> 4. [Vitrification does not offer the lowest estimated environmental releases, however it does offer the best stable waste form for all the high-level waste.] The State's Settlement Agreement has numerous legitimate stipulations, which are restated in the EIS Forward. [Through a process of elimination, portions of the "early vitrification" is the only alternative that meets all the Settlement Agreement stipulations, and is supported by EDI in principal assuming a complete separate NEPA and RCRA permitting process.] [Unacceptable and illegal parts of "early vitrification" are sending the sodium bearing waste to WIPP.] This part is illegal because it remains HLW that New Mexico will not allow in WIPP. WIPP has a very limited capacity for remote handled waste. Even if DOE is able to over ride the State of New Mexico's justified legal objections to accepting HLW, [the remote handled waste can only go in the sidewalls in limited locations, and there are ample hot TRU from many other sites vying for these spots.]  
68-27 <sup>iii.D.2.C(1)</sup> 5. Vitrification is a process of mixing ground glass with liquid or calcined high-level waste in a electrically heated melter then pouring the mixed liquid into stainless steel canisters. The glass is the most stable in terms of leach resistant

characteristics. A vitrification plant is currently operating at the DOE's Savannah River Site.

#### Caveats

- 68-34 <sup>vi.A(2)</sup> 1. [DOE must gradually scale up through pilot scale demonstration project to first prove proof-of-process of unproven technologies and emission control removal efficiencies]  
68-35 <sup>ix.D(6)</sup> 2. [DOE must develop robust project management and strategic oversight of contractors to avoid another Pit-9 fiasco]  
68-37 <sup>x(4)</sup> 3. [DOE must abandon its disastrous experiment with privatization of treatment facilities.] The recent announcement that the BNFL vitrification plant planned for Hanford doubled in price from \$3.6 to 13 billion is an example where cost savings turned into massive cost over runs.  
68-38 <sup>ix.D(6)</sup>

- 68-39 <sup>v(4)</sup> [Reclassifying High-Level Waste to Mixed Transuranic is Illegal]

On July 28, 1998, the Natural Resources Defense Council (NRDC) filed a legal petition with the Nuclear Regulatory Commission (NRC) "to assume and exercise immediate licensing authority over all high-level radioactive waste (HLW) that is stored in the 51 underground tanks located on the DOE Savannah River Site (SRS). The SRS Tanks are being decommissioned under DOE's High-Level Waste Storage Closure Program."

- 68-41 <sup>v(12)</sup> Even the most casual reader of this petition will recognize the similarities between [DOE's actions at SRS and those intended at INEEL with respect to the slight of hand and arguably illegal delisting of Idaho Chemical Processing Plant (ICPP) high-level tank farm waste.] DOE has delayed the release of the Draft INEEL High-level Waste Environmental Impact Statement until the Spring of 1999. Until that draft is released it remains uncertain how DOE proposes disposition of this HLW. DOE's actions at SRS pose a serious threat because the lessons learned at Hanford are not translated to other sites. This letter is an attempt to demonstrate our collective solidarity on this issue of HLW definition and NRC jurisdiction. We will not wait until the draft EIS is released to comment. The momentum of the "decide, announce, and defend" decision making requires early intervention.  
68-42 <sup>vi.C(1)</sup>

- 68-43 <sup>vii.C(1)</sup> In October of 1996 [DOE released a document called "Regulatory Analysis and Proposed Path Forward for the INEEL High-level Waste Program." This plan lays out in detail what the Department's intentions are for high-level waste disposition. From an environmental advocate's perspective, this plan is a shocking rerun of the terminated Hanford tank waste grouting program.] This canceled program involved mixing Hanford's high-level liquid wastes in their tank farm with cement (grout) and dumping it back into the ground. The March 1998 summary of the HLW EIS scooping only reinforced the 1996 HLW program document. [And again, the INEEL HLW Draft EIS perpetuates these illegal HLW management options.]  
68-44 <sup>v(4)</sup>  
68-45 <sup>vii.C(1)</sup>

- New Information -

Idaho HLW & FD EIS

- 68-46 v(9) [DOE seems to have overlooked what is clear language in the NRC rules and regulations listed in 10 CFR that define the INEEL tank waste as HLW and to require an NRC licence as a HLW geologic repository comparable to the proposed Yucca Mt. HLW geologic repository.] DOE is proceeding with firm statements that the LAW is Low-Level Waste under DOE agreement with NRC, where NRC cited three requirements the waste must meet following the performance of a detailed performance assessment in order to be treated equivalent to LLW. [DOE only has authority to license disposal of LLW but not HLW.] NRC has authority to license both. NRC regulatory oversight and licensure is required since the waste is still HLW.
- 68-48 v(10)
- 68-49 v(12) [DOE wants to reclassify tank heels and remaining liquids as "residual" waste and consider it also as "incidental waste." DOE fails to recognize that "incidental waste" is not a separate waste class, but is a subpart of HLW.] This
- 68-51 v(13) [DOE attempt to reclassify HLW extends to a) leaked tank waste, b) previously intentionally disposed HLW, and c) HLW in ancillary piping, ventilation and equipment in the same way.] The hazard posed by each of these categories of waste is enormous. DOE must treat this waste as HLW and obtain NRC licensure, and apply NRC standards to the waste disposal citing, and handling.
- DOE is floating the idea that leaked waste can be handled and regulated under the CERCLA and RCRA and avoid the HLW/LLW licensure issues entirely. Superfund, and State Hazardous Waste Management statutes require the compliance with Applicable or Relevant and Appropriate Requirements (ARARS) that cannot be waived. The substantive portion of ARARS's must be met. Only the procedural and working parts of these ARARS's can be waived. EPA may waive all of an ARARS based on any of nine criteria, however, these waivers are difficult to invoke and can lead to later challenges. [The National Environmental Policy Act (NEPA) and the state equivalent law (SEPA) must also be complied with.] DOE continues to apply only one of these laws as a means to exclude the rest.
- 68-53 v(11.A)(3)
- NEPA, SEPA, CERCLA, and RCRA require very similar information. The process to implement NEPA is governed by regulations from the presidents Council on Environmental quality. It is not difficult to meld these three processes into one continuous and integrated process. They are very similar in many ways. There are major philosophical differences in implementation of CERCLA and NEPA in the way the public is involved and in the ability of stakeholders, responsible parties and others to sue. However, the actual working processes are very similar. NEPA does a better job of requiring a long term look and of requiring examination of reasonable alternatives. CERCLA and RCRA require a much more detailed gathering of data. NEPA and SEPA require good public involvement and stewardship of resources, and CERCLA and RCRA have a more structured public involvement that is aimed at having the public review final documents. It is not hard to combine these.
- There are three main categories of radioactive waste, high-level, transuranic, and low-level. Under each of these main waste categories there are numerous subgroups. Different federal regulations apply to the disposal of different waste categories. Because of this regulatory framework, considerable

- emphasis is given to properly assigning the right category or class to a given waste. Unfortunately, the regulations are not as explicit in defining waste categories as one would hope.
- The Nuclear Regulatory Commission defines high-level waste by the process that created it as opposed to specific characteristics. High-level is, (1) irradiated reactor fuel, (2) the waste generated by the processing of irradiated reactor fuel, (3) the solids into which the liquid wastes were converted.
- Another wild card in this process is the regulation on the characteristics of treated wastes. Each high-level repository must have what are called waste acceptance criteria. This means all waste shipped to that repository must meet certain standards to ensure the contamination will not migrate and compromise the dump. Since DOE does not have a high-level dump yet there are no waste acceptance criteria. The Yucca Mt. Nevada site is still under evaluation. Currently, the collective wisdom is that waste vitrified into a glass form will meet any repository criteria, because the Land Disposal Restrictions (LDR) are met for RCRA listed hazardous wastes.
- 68-54 111.F.2(2) [Despite the uncertainty of not having high-level waste acceptance criteria DOE must move forward in selecting treatment technologies and start building the plants.] Court ordered compliance agreements with enforceable deadlines are the current drivers. Had DOE followed through with its 1977 Environmental Impact Statement commitments to vitrify the high-level wastes into a glass form, the Department would not be in its current bind. DOE's Record of Decision on its 1995 INEEL Environmental Impact Statement states that: "The technology selected [for high-level waste] is radionuclide partitioning for radioactive liquid and calcine waste treatment, grout for immobilizing the resulting low activity waste stream, and glass (vitrification) for immobilizing the resulting high-activity waste stream."
- A similar high-level waste treatment program at the Hanford Nuclear Reservation in Washington State generated so much public opposition that DOE was forced to cancel the project. The question of waste classification played a crucial role in ending the Hanford grouting program. DOE tried in 1990 to delist much of its high-level liquid waste saying it was not really high-level and therefore could be mixed with cement (grout) and dumped back into the ground. The Oregon and Washington State regulator's position is that the tank farm waste is high-level and therefore regardless what DOE's separations treatment, it must be managed and disposed as high-level wastes.
- 68-55 v(9) [DOE is trying to pull the same high-level low-level nonsense at INEEL apparently thinking Idahoans are not aware of the Hanford escapade.] The radionuclide partitioning technology is a process of separating out the transuranic elements (heavier than uranium) from the rest of the waste and calling it "high-activity." This "high-activity" waste would then be vitrified (made into glass) and eventually shipped to a geologic repository. The "low-activity" (LAW) waste (everything else) would be mixed with cement and dumped back into the high-level tanks at the ICPP or into the ground at the INEEL Radioactive Waste Management Complex. The driver to this treatment approach is money. The separations approach is cheaper because the volume shipped to a geologic

repository is small and the volume dumped back into the ground is large. The Department also thinks that it can ship the small volume of high activity waste to another site to be vitrified, thereby avoiding building a plant at INEEL. Since DOE is building a vitrification plant at Hanford, the Department likely will ship INEEL's high-level waste there for treatment and avoid spending the \$3 billion on vitrification plant in Idaho.

Another driver is waste repository capacity. Even if DOE can open Yucca Mt., its design capacity is not sufficient to hold the accumulated volume of commercial power reactor waste plus the military high-level waste. [INEEL's radioactive waste is considered military because it was generated in support of the nuclear weapons programs. DOE now acknowledges that "... no [INEEL] HLW will be sent to the first repository by 2035. The second repository will take 30 years to license and open."<sup>71</sup>

Because of this waste constipation, DOE is looking for every excuse to reduce the volume of high-level waste requiring repository space. To complicate the problem further, [DOE is not looking for another repository site that will be needed even if Yucca Mt. opens.]

The show stopper of the Hanford grouting program occurred when the States of Washington and Oregon, and the Yakima Indian Nation filed a petition with the Nuclear Regulatory Commission (NRC) for a rule making on the classification of the Hanford tank wastes. DOE backed down when the grouting (mixing with Portland cement) the "low-activity" waste did not meet the disposal requirements for high-level waste in the NRC regulations. The NRC did subsequently release a vaguely worded discussion paper in an attempt to answer the Petitioners request.

Hanford now is planning to vitrify both the high and low activity parts of its high-level wastes. The low-activity parts are to be stored on-site in a retrievable form. Thomas Tebbs with the Washington Department of Ecology believes this is a step in the right direction; but that it is a waste of resources to separate the high and low wastes; best just vitrify the whole volume together in one operation. [The bottom line for the regulators is that both "high" and "low activity" waste is high-level by definition and must be managed in compliance with the statutes and regulations.]

DOE's cleanup shortcuts at INEEL make it clear that the culture within the Department has not changed. Shortcuts taken over the last four decades are the reason we now see cleanup cost pushing \$29 billion to partially remediate the site under Superfund. Every year, every decade that passes, the costs only escalate. The worst part of delaying environmental restoration is the pollution migrates away from the source every day. The further contaminants migrate the more unlikely any corrective action can be taken.

DOE's INEEL high-level waste (HLW) planning document perpetuates this shell game by stating: "The sodium-bearing and other mixed liquid wastes stored in the ICPP Tank Farm should not be classified and managed as HLW." [This sodium-bearing waste constitutes about 3/4 of the total liquid high-level volume (~ 1.9 million gallons) in the ICPP tank farm.] [The Environmental Defense

68-61 v (7) Institute's review of the ICPP's former operator, Phillips Petroleum Co., quarterly reports show clearly the chemicals used to dissolve the reactor fuel rods were sodium nitrate and sodium hydroxide. Wastes generated in the fuel dissolution process went to the tank farm. There is no question that this waste meets the definition of high-level waste.]

68-62 III.C (5) INEEL is unique from Hanford and other DOE sites because it used a calcining treatment process that converts most of the high-level liquid waste into a granular form stored in seven large underground silos at the ICPP. [The Calcliner is a incinerator that burns off the liquid portion and mixes the residual ash with granular calcine material so it can be pneumatically easily handled.] Unfortunately, the sodium-bearing waste is not readily calcined unless it is diluted with aluminum nitrate. [DOE put off calcining the sodium-bearing waste until it was faced with court ordered deadlines.]

68-63 VII.D (6) 68-64 v (4) [The sodium-bearing waste volume in the ICPP tank farm is about 1,648,400 gallons.] DOE's recent attempt to reclassify or delist this high-level waste is illegal because it meets the Nuclear Regulatory Commission definition that includes the waste generated by reprocessing spent reactor fuel and the concentrated wastes from subsequent extraction cycles, or equivalent.

Between 1954 and 1963 the Idaho Chemical Processing Plant (ICPP) dissolved two day cooled Materials Test Reactor (MTR) fuel. This fuel reprocessing program was known collectively as the RaLa runs. INEEL's equivalent to Hanford's Green Runs. Over this period, more than 113 separate process campaigns were run for the separation of barium-140 delivered to the Oak Ridge National Laboratory and Los Alamos for military programs. The RaLa campaigns used unique chemical separation processes from other ICPP nitric, sulfuric, or hydrofluoric acid uranium extraction campaigns. "This [RaLa] process involved the dissolution of MTR assemblies in a sodium hydroxide-sodium nitrate solution leaving a precipitate of sodium diuranate and fission products." Early Atomic Energy Commission documents leave no doubt that the sodium-bearing high-level waste in the ICPP tank farm is the result of spent nuclear fuel reprocessing and therefore appropriately designated as high-level. Admittedly, a certain amount of the sodium-bearing waste is from decontamination flushes. However, it is still a product of irradiated reactor fuel reprocessing containing all the characteristics of HLW. DOE's own characterization of the sodium-bearing waste acknowledges that it exceeds the low-level Class C definition because of its high alpha emitter constituents. Uranium and plutonium are alpha emitters. Even if a person accepted this > Class C category, near surface disposal would be prohibited by NRC regulations.

Even more troubling is DOE's attempt to use "cementitious [grouting] solidification for treatment" of this high-level waste. The discredited Hanford experience where hundreds of millions of dollars were wasted on a high-level waste grouting program appears to be conveniently forgotten at DOE Idaho Operations Office. Internal DOE Hanford contractor reports revealed that the physical integrity of the grout would not last long. When radionuclides decay, they give off heat and radiation.

- New Information -

Idaho HLW & FD EIS

"Under the expected disposal conditions...the grout will remain at elevated temperatures for many years. The high temperatures expected during the first few decades after disposal will increase the driving force for water vapor transport away from the grout; the loss of water may result in cracking ... as the grout cools... (it) may draw moisture back into the grout mass. The uptake of moisture may have detrimental impacts on the behavior of the grout."

68-65 ✓ (9)  
68-66  
vii.D (6) [Additionally, DOE's attempt to reclassify the sodium-bearing waste may be a violation of the State Agreement with DOE that orders the Department to calcine all the waste in the ICPP tank farm.] The order states that: "DOE shall commence calcination of sodium-bearing liquid high-level wastes by June 1, 2001. DOE shall complete calcination of sodium-bearing liquid high-level wastes by December 31, 2012." Even if DOE fulfills its commitment to calcine the sodium-bearing wastes the issue remains about the classification of the partitioned "low-activity" part that DOE wants to mix with concrete and dump back into the old waste tanks. All the calcine (~3,800 cubic meters) is slated for the same chemical separations process to divide the "high-activity" from the "low-activity" parts.

68-67  
iv.C (2) Another very troubling part of DOE's plan is to leave the high-level tank farm sediments (heels) in the tanks. "The ICPP Tank Farm heels will not be removed and the Tank Farm will be closed under RCRA [Resource Conservation Recovery Act]." "The closed Tank Farm would probably meet the subtitle D landfill standards for industrial waste." Subtitle D is a municipal garbage dump classification. It is obvious to the most pedestrian observer that garbage and radioactive waste are different. [Actually, the ICPP would not even qualify as a Subtitle D dump because it lies in a flood plain.] DOE's plan literally translates into ICPP becoming a permanent high-level waste dump site in clear violation to the applicable statutes.

The tank heels can be removed by conventional dredging technics or use the Hanford Tank Sluicer Mechanism. DOE believes: "However, it is not practical to remove all of the heels from the INEEL tanks, decontaminate the equipment, and remove all surrounding soils due to technological, economic, and health and safety factors involved."

68-68 iii.D.2.c (i) [The Environmental Defense Institute (EDI) believes that the best approach is to vitrify the whole volume of the sodium-bearing liquid, all tank heels, and the calcine high-level wastes without any partitioning or separation of "high-activity and low-activity" wastes.] The State of Idaho must fully review the failed Hanford grout program before committing to a similar project at INEEL.

68-69 iii.D.3 (i) [Another reason the Environmental Defense Institute disagrees with DOE's separating the high activity and low activity parts is the chemistry.] Part of the problem is the complexity of the chemistry involved in separating or partitioning radionuclides from each other in this high-level witch's brew. INEEL scientists recently completed the first stage of a multi-year project called Efficient Separations and Processing Program that preprocesses high-level waste and is funded at a half million per year through DOE's Office of Science and Technology. This project reportedly "separates highly radioactive elements from waste, reducing the volume of high-activity waste that must be disposed of at a

repository." This separations/ partitioning process is also called Transuranic Extraction (TRUEX). Despite the proliferation implications of this program, the grouted residual from this solvent extraction process is destined for low-level burial; or the preferred option is dumping it on top of the waste tank heels. A Science Program Symposium in Richland Washington on June 26, 1996 sponsored by DOE showed that the Department is still struggling with the basic science of chemical separation and the applied technology is still in the hypothetical stage. This means that millions of additional R&D dollars will be required to actualize the technology.

The INEEL Pit 9 waste treatment plant could not get the chemical separations/ partitioning to work. The Pit-9 reburial of the residuals of chemical separations approach does not enjoy public acceptance for many reasons. First, the classification of low-level waste has no connection with environmental, health and safety hazards. It is merely a catchall category for all waste not classified as high-level or transuranic. Secondly, the public demands that the entire volume of the waste be processed directly into a stable vitrified form so that the inevitable interim on-site storage does not continue the migration of contaminants into the environment. Remember, DOE thinks maybe a second repository will be available in forty years. The Final Report from the Hanford Tank Waste Task Force got it right by recommending:

"The high cost and uncertainty of high-tech pretreatment and R&D threatens funding for higher performance low-level waste form, vitrification, and cleanup." "Put wastes in an environmentally safe form, using retrievable waste forms when potential hazards from the waste may require future retrieval and when retrievability does not cause inordinate delays in getting on with cleanup." "Let the ultimate best form for the waste drive decisions, not the size nor timing of a national repository." "Accept the fact that interim storage, at least, of the waste in an environmentally-safe form will occur for some time at Hanford. Select a waste form that will ensure safe interim storage of this waste."

The repeated mantra "get on with cleanup" in the Hanford Waste Tank Task Force is repeated in public interest group reports. DOE is wasting precious resources by refusing to recognize the public's demand for real solutions to the radioactive waste problem. [DOE must "get on with cleanup" and apply research and development (R&D) to technologies that will put all radioactive waste into a stable vitrified form for on-site storage for the near-term because there are no guarantees on any repositories coming on line soon.] Additionally, the DOE is remiss in not investing in the essential R&D on emissions control that will be key to health and safety issues in all waste processing.

As the NRDC's petition shows, DOE's creative approach to its HLW problem is to generate new waste categories such as "low activity and incidental" that have no basis in the statutes or supporting regulations. [HLW remains HLW even if it is leaked waste, intentionally disposed waste, waste in ancillary equipment and ventilation headers, pipelines, transfer lines, etc.] [The HLW regulations extend to vitrified low activity waste (LAW), the salt grout, and related vitrification plants and facilities when these plants are used in support of a geologic disposal area under NRC definitions.] [DOE simply cannot avoid its legal

68-71  
iii.D.2.c (2)

68-73 ✓ (12) +  
68-74 ✓ (11)

68-75 ✓ (10)  
68-76 ✓ (9)

68-17 v (10) obligation to permit its HLW disposition program under the NRC and follow the established waste definitions. Again, as the NRDC Petition shows, even if DOE gets an informal approval from the NRC, the Commission is not supported by the statutes or its own regulations.

68-78 III.D.2.C (1) [Vitrification processing cannot be avoided in stabilizing and preparing the waste to meet future repository acceptance criteria.] To ensure that the nuclear legacy mortgage is paid, the Department must make its case to Congress for specific funding for INEEL Waste Immobilization Vitrification Plant. [Idaho State and Environmental Protection Agency regulators must aggressively challenge

68-81 v (9) DOE's attempt to reclassify formerly high-level waste as low-level and learn from the Hanford debacle.]

68-82 VII.B(2) [DOE's attempt to remediate the tank farm contaminated soils under CERCLA does not absolve the Department from meeting NRC HLW disposal requirements because of the ARARS's.] Attached please find a copy of EDI's Draft Comments on the Draft ICPP Cleanup Plan. A subsequent briefing with the regulators and DOE verbally acknowledged major changes to the preferred alternative. Until a revised draft or the Proposed Plan is released, it is uncertain whether the discussed changes will survive.

#### AMWTP and the INEEL HLW EIS

1. Under the NEPA, the DOE is required to present its alternatives for High Level Waste (HLW) management before selection of an alternative and to compare the environmental impacts of each of the alternatives under examination.

2. DOE committed resources and time, etc. to contract with BNFL for the construction and operation of the Advanced Mixed Waste Treatment Project(the Plutonium Incinerator). Therefore, AMWTP is an actual, real alternative as a means to managing alpha-contaminated and transuranic wastes from INEEL or other DOE sites. (Sec. 3.3.7 at p. 3-61)

68-83 XI(5) 3. [However, DOE does not consider AMWTP as a real alternative, but rather, puts the "TREATMENT OF MIXED TRANSURANIC WASTE/SBW AT THE ADVANCED MIXED WASTE TREATMENT PROJECT" under section 3.3 (p. 3-61) which is the section entitled "Alternatives Eliminated From Detailed Analysis."]

68-85 XI(5) 4. [Then DOE proceeds to omit the AMWTP from its analysis in Comparison of impacts with respect to the various other alternatives it has chosen to identify (No Action Alternative, Continued Current Operations Alternative, Separations Alternative, Non-Separations Alternative and the Minimum INEEL Processing Alternative). (Sec.3.4, p. 3-63).]

68-86 XI(5) 5. [Conclusion: EIS fails to identify AMWTP as an alternative and to compare the environmental, etc. effects of this alternative with its other chosen alternatives, thus violating the NEPA.]

#### NWCF and the INEEL HLW EIS

68-87 XI(5) [For four decades the Department of Energy and its predecessor agencies operated two high-level liquid radioactive waste incineration plants at the Idaho National Engineering and Environmental Laboratory.]

68-88 III.C(5) On February 7th, DOE Officials met with members of Keep Yellowstone Nuclear Free to discuss the DOE's Draft Environmental Impact Statement for High-Level Waste. Mr. Case informed the group that DOE will very soon startup and operate the New Waste Calcine Facility (NWCF) or "Calciner" through June of this year. The Idaho INEEL Oversight Program informed us that the Calciner will restart on March 8, 2000. According to the Draft EIS, the rationale for doing this is:

" DOE studied alternative methods for calcining waste. Two technologies emerged as viable candidates: (1) high temperature calcination and (2) sugar-additive calcination. Based on results of the pilot plant studies, DOE determined high temperature calcination to be the viable technological solution. High temperature calcination will be demonstrated during Calciner operation throughout June 2000." [1-16]

The High-level Waste EIS also says "Since 1995 new regulatory considerations have necessitated another review of treatment options. Some of these considerations include technical constraints, which have hindered DOE's efforts to sample off gas emissions from the New Waste Calcine Facility Calciner,..." [page 2-2 & 2-3]

68-90 III.C(5) [It is our opinion that the risks of restarting the Calciner, in order to determine a technological proof of concept, are unacceptably high for the residents, workers and the environment. EPA and the State of Idaho should not allow this restart to proceed.] [DOE is simply taking advantage of a regulatory loophole to perform risky experiments that they won't be able to do after June.]

68-92 III.C(5)

#### The Relevance of the High-Level Radioactive Waste Incinerator at INEEL

The operation of the high-level waste calcine facility has significant relevance to the decision to grant environmental permits to proposed Advanced Mixed Waste Treatment Project (AMWTP) because both facilities involve the incineration of very dangerous radioactive substances. According to a recent discussion we had with officials at the Region X Office of the Environmental Protection Agency (EPA), we learned that since 1982, the INEEL Calciner incinerator operated on an interim status, under a 1992 "Consent Order" later amended in 1994 and 1998. [The Department of Energy was not held to the requirements under Part B of a RCRA permit. DOE only had to meet vague requirements for the past eighteen years under a regulatory regime that is best described as "hands off." Thus, one of the most dangerous hazardous waste incineration facilities in the country was allowed to operate between 1982 and

68-93 III.C(5)

1990 with ad hoc RCRA regulatory requirements that were not tied to quantifiable performance standards normally required for hazardous waste incinerators.]

We find this situation highly disturbing. The incineration of high-level radioactive wastes is an ultra hazardous activity under federal law. Its risks to human health and the environment cannot even be remotely compared to the incineration of municipal wastes, which were subject to more stringent regulatory requirements over the past 18 years.

By virtue of having an "interim status" under a "Consent Order" with the EPA and the State of Idaho from 1982 to 2000, the clear implication is that this facility was not able to meet legal permitting requirements and would not have been allowed to operate. [This leads us to believe that the failure to impose Part B RCRA permitting requirements on the high-level radioactive waste incinerator at INEEL, created unacceptable risks to workers and the public.] This concern is underscored in the Appendices to our comments, which document continuing and serious operating problems which led to excessive releases and excessive worker exposures, as well as DOE Headquarter oversight findings of serious deficiencies, and repeated concerns by the Defense Nuclear Safety Board about the failure of DOE and its contractors to address fundamental safety issues at this facility.

[The lax regulation and troubling operation of the high-level radioactive waste incinerator or "Calciner" at INEEL deserve a focused independent review involving the Environmental Protection Agency and outside experts not affiliated with the DOE, before permits are granted for the Advanced Mixed Waste Treatment Project.]

#### High-level Radioactive Waste Incineration at INEEL

Since the early 1960's the Idaho National Engineering and Environmental Laboratory operated high-level radioactive facilities for the purpose of converting these wastes to a solid and a more stable form for storage. The process involved a technology known as calcination. Calcination of high-level liquid radioactive wastes involve the use of fluidized-bed and combustion of kerosene to dry the liquified nitric acid high-level wastes.

The liquid high-level waste was generated from the chemical separation of highly enriched uranium and other materials from "high-burn-up" spent naval reactor fuel at the Idaho Chemical Processing Plant. These nitric acid wastes contain large concentrations of transuranic and fission products and were stored in stainless steel tanks. The wastes were then drawn from the Tank Farm and sprayed into a vessel containing an air-fluidized bed of granular calcine solids. The bed is heated by combustion of a mixture of kerosene and oxygen. All the liquid evaporates, while the radioactive fission products adhere to the granular calcine bed material in the vessel.

The Calciner involves several systems including a Denitration Plant which reduces the nitric acid content of the wastes, a High-level Liquid Waste

Evaporator to further reduce the liquids, and a fluidized bed incinerator that burn off the liquid leaving behind a granular mixture. In effect calcination is a technology to bake away the liquids from the waste. In doing so, this process involves the processing, handling of extremely dangerous radioactive wastes – which in minuscule quantities can be lethal. The high-level wastes come from the Idaho Chemical Processing Plant (ICPP) which extracted plutonium and highly enriched uranium from spent naval reactor fuel shipped to the Idaho site. The highly enriched uranium was used in the nuclear weapons program.

A high-level waste Calciner, if not adequately controlled can be a major aerosol emitter of extremely dangerous radioactive wastes. [By virtue of the extremely concentrated radioactivity in the wastes, the Calciner is even more dangerous than the proposed plutonium incinerator.] INEEL has been calcining high-level wastes since 1963. According to DOE "old timers," we've been told that the early Waste Calcine Facility released significant amounts of radioactivity to the air.

The current New Waste Calcine Facility was brought on line in 1982 and ran four "campaigns," the most recent being between May 1997 and May 1999. DOE wants to restart the Calciner and run it through June of 2000, because the Department claims emission and waste characteristic data is needed to support a RCRA permit application which DOE must submit to the State of Idaho in order to continue running the Calciner. [If such a permit has not been applied for by June 1, 2000, the State has ordered DOE to cease Calciner operations until such a permit is granted.] [The remaining 1.4 million gallons of high-level liquid sodium bearing waste that DOE is considering calcining have sufficiently different characteristics so that previous emission data is not applicable.] In addition to the RCRA permit, EPA has new air quality standards for hazardous waste combustion units. These standards must be met to allow continued operation of the Calciner after 2002. DOE is required to formerly announce by June 1, 2000 its intent to upgrade the Calciner so compliance will be met by the year 2002 deadline. Physical upgrades to the Calciner and collection of additional data would be required in order to comply with these new standards at considerable expense. According to the High-Level Waste EIS:

Calcining of sodium bearing waste may involve the addition of aluminum nitrate or other additives (approximately three volumes of aluminum nitrate per volume of sodium bearing waste) to prevent the sodium and potassium nitrates in the waste from clogging the calcine bed at the current operating temperature. Operating of the Calciner at elevated temperature (600 degree versus 500 degrees Celsius) may reduce the need for these large amounts of inert additives, increasing the sodium bearing waste processing rate and reducing the volume of calcine produced. [3-10]

#### Problems with the Calciner



D-179

DOE/EIS-0287

The Calciner facility has a disturbing history of accidents equipment failures, widespread environmental contamination and worker over exposures. The Calciner is one of several operations within the 200 acre INTEC (formerly called Idaho Chemical Processing Plant) compound that share common safety and emission control systems. For instance between 1991 and 1999:

- There were at least 18 incidents where equipment, and filter failures, power outages, and poor conduct of operations resulted in excessive atmospheric releases of radioactive aerosols. In some cases there was widespread and severe contamination. For example, in April 1992 employees were forced to remain indoors after an accidental release from the main stack went beyond the plant boundary. Forty acres were contaminated and five to six acres of land had to be decontaminated.
- In 1991, an explosion at the INTEC caused worker over exposures, and significant damage to the facility due to negligence by the contractor and the DOE.
- There were six fires at the Calciner and INTEC. Inspectors also found several instances where fire and radiation alarms were shut off.
- There were at least 18 incidents where workers were overexposed to radiation.
- DOE safety oversight teams have reported a continuing decline in safety. According to a September report by the DOE Headquarters Office of Environment, Safety and Health, "Workplace safety at INEEL has deteriorated since 1994 . . . corrective action plans found that deficiencies were not resolved and that lessons learned from previous accidents were not being effectively applied. In environmental management and controls, data indicate weak regulatory compliance and inadequate, short-term, quick fix solutions . . . one fifth of all INEEL occurrences in 1997 were related to radiation protection (personnel contamination) and environmental management occurrences have increased by one third from 1994 to 1997."
- DOE's contractors have been repeatedly fined for environmental and safety non-compliance. Since 1994 the State of Idaho issued four Notices of Violation for Non Compliance resulting in more than \$1 million in penalties. During that time period there were 26 DOE enforcement actions.
- In the last five years, the Defense Nuclear Facility Safety Board issued nine reports on the Calciner and related high-level liquid waste evaporator. All five reports challenge the Calciner's readiness to restart operations. The June 2, 1997 report "commented on the failure of the DOE Idaho Operations Office to identify inadequacies in the contractor's state of readiness before certifying

readiness for operations and commencement of the Operational Readiness Review for the high-level liquid waste evaporator." See Exhibits

- The High-level Waste EIS says that "technical constraints, have hindered DOE's efforts to sample off-gas emissions from the New Waste Calcine Facility," so there is uncertainty about what is going out the stack.

#### Discussion

DOE openly admits that the Calciner cannot meet the EPA's 1995 clean air act standards which take effect, coincidentally at the end of June of this year. It is highly unlikely that the Calciner will ever comply with the existing Clean Air Act standards. According to a meeting that Chuck Broschious had with Brian English of the Idaho Department of Environmental Quality on August 30, 1999, English stated that DOE is not doing real time continuous monitoring of the Calciner stack and is only taking periodic grab samples (presumably when the filters are not shut down from power failures). According to English, DOE is not monitoring for particulate emissions which means substances such as plutonium and nonvolatile beta/gamma emitters such as cesium-137 are not being monitored. Apparently the stack environment is so toxic and radioactive that instruments rapidly fail.

If DOE is not performing adequate measurements of the preponderance of contaminants by volume and toxicity then it is not complying with the current Clean Air Act standards, as promulgated before 1995. The Calciner has been operating since 1982 without a permit required by the Resource Conservation Recovery Act (RCRA), and has functioned for the last ten years as an "interim status" facility under a Consent Order granted by the State of Idaho and EPA. A modification to the Notice of Noncompliance Consent Order on April 19, 1999 stipulates that DOE must place the New Waste Calcining Facility Calciner in a standby mode by June 1, 2000 unless the facility receives a hazardous waste permit for continued operation. These agencies can hardly call themselves regulators when they failed for 18 years to require that DOE get a full Part A and Part B RCRA permit. The Part B involves trial burns that are extensively monitored to determine if the emissions are within regulatory requirements. The bottom line is DOE has never wanted to spend the money required to upgrade the Calciner so it could meet full RCRA permit requirements.

At the minimum, EPA should conduct a special review of the State of Idaho's Consent Order to determine if it is adequate with respect to minimal requirements for measuring airborne pollutants at the Calciner. The Calciner facility should not be restarted unless this is done.

- New Information -

Idaho HLW & FD EIS